



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/631,501	08/03/2000	Timo Herranen	460-009567-US(PAR)	9806

7590

07/08/2003

Clarence A Green
Perman & Green LLP
425 Post Road
Fairfield, CT 06430

EXAMINER

CAPUTO, LISA M

ART UNIT

PAPER NUMBER

2876

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/631,501

Applicant(s)

HERRANEN, TIMO

Examiner

Lisa M Caputo

Art Unit

2876

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15, 16 and 19-21 is/are allowed.
- 6) ☒ Claim(s) 1-14 and 17-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 April 2003 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 10-12, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Aldous (U.S. Patent No. 6,266,017).

Aldous teaches a retractable antenna system (method and apparatus) having all of the elements and means as recited in claims 1-5, 10-12, and 17-18.

Regarding claims 1 and 10-11, Aldous teaches an embodiment of a wireless communication device (pagers, cellular phones, PC cards, etc.) where the entire active radiating element of an antenna extends beyond a housing which is enclosing or partially enclosing the wireless communication device. More specifically, Aldous teaches an expansion card which comprises a frame part 102, an antenna rod structure

104 which has a first end and a second end (the first end being the end of the finger grip 106 and the second end being the opposite end), where the first end transmits and receives signals, and the second end is adapted to be placed movably inside the frame part so that the second end moves in relation to the frame and the antenna structure is arranged to be movable by inserting the first end of the antenna structure into an interior of the frame of said card and extending the first end outside the frame (see Figure 5, col 9 line 27 to col 10 line 56).

Regarding claim 2, Aldous teaches that when an embodiment includes circuitry on a movable portion movable between a retracted position and an extended position, means to electrically couple the circuitry within housing 80 with the circuitry on the movable portion is required. Such means comprises a ribbon cable 94. Ribbon cable 94 should have sufficient number of conducting wires to carry needed electrical signals between the electronic circuitry residing in housing 80 and any electronic circuitry residing in movable portion 82 (see Figure 3). Regarding Figure 5, the ribbon cable 130 is the means to electrically couple signals from the movable portion 114 (moveable portion 114 is connected to the second end of the antenna) to the means for processing signals in the frame 102 (see Figures 3 and 5, col 9, lines 1-17, col 19).

Regarding claim 3, Aldous teaches that when movable portion 82 is in a retracted position, movable portion 82 and housing 80 combine to form a standard size PC card such as a type 2 PCMCIA card having well known dimensions of about 85.6 mm in length by about 54 mm in width in a substantially rectangular shape by about 5.5 mm thickness (see Figures 3, col 7, lines 19-24).

Regarding claim 4, Aldous teaches that illustrates an embodiment of the wireless communication device (PC card device). Aldous discloses that the embodiment has a detachable portion 140 (card of the instant application). Attached to the detachable portion 140 is a dipole antenna 142. As illustrated in Figure 8, detachable portion 140 can be attached to housing 144 (expansion card of the instant application) through connector 146. As can also be seen, the antenna is on the opposite end of the connecting means of the card (See Figure 7-8, col 11, lines 1-11, col 12, lines 5-12).

Regarding claims 5 and 12, Aldous teaches that in Figure 7, antenna contact 164 is illustrated as a spring contact which engages antenna 158 when antenna 158 is in the extended or deployed position. Hence, the antenna structure is arranged to be pushed out by a spring means fitted inside the card. (see Figure 7, col 11, lines 61-66).

Regarding claims 17-18, Aldous teaches that FIG. 5 illustrates another preferred embodiment of the present invention. Embodiments within the scope of this invention can be provided with grounding means, movable between a retracted position and an extended position, for forming an RF ground plane which extends beyond any housing which may enclose or partially enclose the wireless communication device. In FIG. 5, such grounding means are illustrated by movable portion 114. In the preferred embodiment illustrated in FIG. 5, movable portion 114 does not extend the full width of housing 102. Such an embodiment may be desired where the electronic circuitry incorporated into movable portion 114 does not require an area which extends the full width of housing 102. Movable portion 114 is designed to move between a retracted position and an extended position. Movable portion 114 is therefore connected to

housing 102 via sliding means for allowing movable portion 114 to slide between an extended position where movable portion 114 is separated from housing 102 by a predefined distance and a retracted position where movable portion 114 is next to housing 102. In the preferred embodiment illustrated in FIG. 5, such sliding means comprise slide 116 and tongue and groove assembly 118. In FIG. 5, slide 116 is received into slide channel 120. Tongue assembly 118 is formed from a dovetail or tongue and groove shape formed between movable portion 114 and housing 102 (see Figure 5, col 9, lines 27-52). Hence, Aldous teaches, as can be seen in Figure 5, that the antenna structure is movable in a direction parallel to a longitudinal direction of the antenna structure while being inserted in the card and while being extended outside the card, and further, that the second end is movable for bringing said antenna structure partly or fully inside frame part and farther away from an exterior of said frame part.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 6-9 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aldous in view of Phillips (U.S. Patent No. 4,725,845). The teachings of Aldous have been discussed above.

Aldous fails to teach the specific method of locking the antenna by first pushing it inwards and then releasing it and the pivoting position lever as recited in claims 6-9 and 13-14.

Phillips teaches a retractable helical antenna. Mechanical stop 24 is mounted to rod 16 below tuning core 13 such that the stop contacts radio housing 14 to limit the extension of the antenna. The exact configuration of stop 24 would be dependent upon the particular radio housing and cavity construction. A flat, round washer, having an outer diameter slightly larger than the diameter of rod 16 and core 13, may be readily implemented. However, in the preferred embodiment, a square washer, having outer side dimensions equal to the rod diameter and having an inner hole diameter equal to the reduced-diameter section of the rod, is used as mechanical stop 24. Accordingly, cavity 22 would exhibit a square cross-section, having side dimensions slightly larger than the rod and washer outer dimensions to allow the square washer to slide within the cavity. This square washer/square cavity configuration requires less wasted cavity volume than a round cavity configuration--an important consideration in miniature radio design. Further, it also provides better mechanical support when retracting the antenna, since the entire length of the round rod contacts the four walls of the square cavity along four lines parallel to the rod's longitudinal axis, in addition to contacting the edge of the washer. The lower end of the dielectric rod is retracted within the radio housing into cavity 22 when the antenna is in the standby mode. A latching mechanism, such as rotatable barrel-cam 20, is located below mechanical stop 24. The barrel-cam may be secured to the rod by a nut (shown as 85 of FIG. 8). Barrel-cam 20 interacts with pins

21a and 21b, which are secured to the inside wall of cavity 22, to retain rod 16 in the retracted position. In the preferred embodiment, the antenna is changed from the retracted to the extended position by pressing on top cap 18 to trigger the latch mechanism, and then releasing the pressure to allow the helical spring force to extend the antenna. This procedure is identical to change from the extended to the retracted position. A further description of the latching mechanism is provided later (see Figures 1-2, col 4, line 40 to col 5 line 11).

Referring now to FIG. 6, a detailed perspective view of latching mechanism 60 is illustrated. Pin-following barrel-cam 20 is rotatably mounted to the end portion of rod 16 located inside the radio housing. Although not illustrated in this partial view, tuning core 13 would be affixed to rod 16 above cam 20. Pins 21a and 21b are secured to the inside walls of radio housing cavity 22. These pins 21a and 21b interact with slots 62 and 72 in barrel-cam 20 to cause the antenna rod 16 to latch and retain the helical antenna in the retracted position. The antenna is changed from the retracted position to the extended position by pressing downward on antenna top cap 18 until a stop is felt, and then releasing the pressure to allow the antenna to extend outwardly under the force of the helical spring. The procedure is identical to change from the extended to the retracted position. The antenna positioning operation may be performed by using a single finger (or the thumb) while still holding the radio housing in the same hand. Hence, a one-hand push-to-retract/push-to-extend antenna operation is created. The operation of latching mechanism 60 can best be understood by the two-dimensional diagram of FIG. 7. This diagram represents the face of the barrel-cam projected onto a flat surface. The

Art Unit: 2876

circles A through I of FIG. 7 represent the various positions of either pin 21a or 21b following channel 61 in cam 20 as the cam rotates. The pin appears to move from left to right by way of positions A through I as the antenna is operated through one retracting/extending cycle. Since the barrel-cam is bilaterally symmetric, the operational sequence will be identical for pins 21a and 21b. For brevity, only the latching sequence for pin 21a will be described, with it being understood that the sequence for 21b is identical. It should be noted that the stationary frame of reference for FIG. 7 (the barrel-cam itself) is different from the actual frame of reference (the radio housing and pins) of FIG. 6. However, it is believed that a better explanation can be provided with such a diagram. When the antenna is pressed downward into the radio housing, pin 21a enters channel 62 in cam 20 at position A. The pin then contacts channel wall 63 at position B which causes the cam to rotate 45 degrees (pivot) as the antenna continues downward. A stop point C is reached at wall 64, and the downward pressure on the antenna should now be released. The spring force of the helix pushes the antenna upward until channel wall 65 contacts pin 21a at position D. The spring continues to push the rod upward until cam 20 has rotated another 45.degree. to position E. The antenna is now latched in the retracted position at position E adjacent to channel wall 66. To go from the retracted antenna position to the extended position, a similar sequence occurs. A downward force is initially applied to the antenna top cap which causes pin 21a to move upward until channel wall 67 is contacted at position F. Further downward travel of the antenna causes cam 20 to rotate another 45.degree. until wall 68 is contacted. The antenna is now at the downward stop position G. At this time, the

downward force on the antenna should be released. The spring force of the helix then pushes the antenna rod upward until pin 21a contacts wall 69 at position H. As the antenna continues to move upward under the spring force, cam 20 rotates still another 45.degree. to position I at wall 70, where the pin is free to disengage from the cam via channel 72. The antenna now continues traveling upward to the fully extended position shown in FIG. 1. An appropriate upward travel mechanical stop should be provided to fix the exact position of the rod and core within the helix. As we have seen, the push-to-retract/push-to-extend latching mechanism of the present invention provides the preferred one-hand operation in a severely restricted environment (see Figures 6-7, col 8, line 37 to col 9, line 42).

In view of the teaching of Phillips, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a specific locking mechanism that can be efficiently activated to the system as disclosed by Aldous because it is favorable to be able to engage or disengage the antenna locking system in an efficient way. The method as taught by Phillips is efficient because it allows the user to physically engage and disengage the latch and locking mechanism in order to be able to extend and retract the antenna. In addition, it is proper to combine Phillips with Aldous since both Phillips and Aldous teach devices with retractable antenna systems. Phillips overcomes the limitations of the current claims by using a latch and locking mechanism for an antenna that is retractable. It would have been obvious to one of ordinary skill in the art at the time the invention was made to be able to use the system of Phillips with Aldous because no matter what the antenna orientation (i.e. horizontal or

vertical) the latch and locking mechanism is performing its function of regulating the movement of the antenna.

Allowable Subject Matter

4. Claims 15-16 and 19-21 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter:

The best prior art of record fails to teach the limitations of the amended claim 15 and its dependent claims. For example, Aldous teaches a ribbon cable for electrical connection whereas Phillips teaches a spring wire 15. The best prior art of record fails to disclose the specific arrangement of the present invention for including a contact pin and contact spring for establishing electrical connection. More specifically, the best prior art of record fails to teach the arrangement of the electrical connections to specific positions of the lever of the locking means of the present invention. In addition, see applicant's amendment/response of paper no. 10.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent No. 6,149,470 to Northey et al. which discloses an electrical connector for antenna or the like.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Lisa M. Caputo** whose telephone number is **(703) 308-8505**. The examiner can normally be reached between the hours of 8:30AM to 5:00PM Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone number for this Group is (703)308-7722, (703)308-7724, or (703)308-7382.

Art Unit: 2876

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [lisa.caputo@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



LMC

June 23, 2003



**THIEN M. LE
PRIMARY EXAMINER**